

ing about her doll in her own perambulator, the writer stole away the doll without her perceiving the theft. When she thought that the doll had had a sufficiently long ride, she walked round the perambulator to take it cut. Not finding the doll where she had left it she was greatly perplexed, and then began to say many times "poor Na-na, poor Na-na," "Na-na ta-ta, Na-na ta-ta"; this clearly meant—Poor Na-na has disappeared. And many other examples might be given of this child similarly using her small stock of adjectives and verbs correctly.

According to Preyer, from the 1st week to the 5th month the only vowel-sounds used are *ü* and *a*. On the 43rd day he heard the first consonant, which was *m*, and also the vowel *o*. Next day the child said *ta-hu*, on the 46th day *gö, örö*, and on the 51st *arra*. All the vowel sounds were acquired in the 5th month. We have no space to go further into the successive dates at which the remaining consonants were acquired. In the 11th month the child first *learnt* to articulate a certain word (*ada*) by imitation, and afterwards repeated the taught word spontaneously. The first year passed without any other indication of a connection between articulation and ideation than was supplied by the child using a string of different syllables (and not merely a repetition of the same one) on perceiving a rapid movement, as any one hurriedly leaving the room, &c.; but this child nevertheless understood certain words (such as "Handchen geben") when only 52 weeks old. Inefficient attempts at imitative speaking precede the accurate attempts, and at 14 months this inefficiency was still very apparent, being in marked contrast with the precision whereby it would imitate syllables which it could already say; the *will* to imitate all syllables was present, though not the *ability*. At the beginning of the 14th month on being asked—"Wo ist dein Schrank?" the child would turn its head in the direction of the cupboard, draw the person who asked the question towards it (though the child could not then walk); and so with other objects the names of which it knew. During the next month the child would point to the object when the question was asked, and also cough, blow, or stamp on being told to do so. In the 17th month there was a considerable advance in the use of sign-language (such as bringing a hat to the nurse as a request to go out), but still no words were spoken save *ma-ma, pa-pa*, &c. In the 20th month the child could first repeat words of two unlike syllables. When 23 months old the first evidence of judgment was given; the child having drunk milk which was too hot for it, said the word "heiss." In the 63rd week this word had been learnt in imitative speaking, so it required 8½ months for it to be properly used as a predicate. At the same age on being asked—"Where is your beard?" the child would place its hand on its chin and move its thumb and fingers as if drawing hair through them, or as it was in the habit of doing if it touched its father's beard; this is evidence of imagination, which, however, certainly occurs much earlier in life. At the close of the second year a great advance was made in using two words together as a sentence—*e.g.* "home, milk," to signify a desire to go home and have some milk. In the 1st month of the 3rd year sentences of three or even four words were used, as "Papa, pear, plate, please." Hitherto the same word would often be

employed to express several or many associated meanings, and no words appeared to have been entirely invented. The powers of association and inference were well developed. For instance, the child received many presents on its birthday, and being pleased said "bursta" (= Geburtstag); afterwards when similarly pleased it would say the same word. Again, when it injured its hand it was told to blow upon it, and on afterwards knocking its head it blew into the air. At this age also the power of making propositions advanced considerably, as was shown, for instance, by the following sentence on seeing milk spilt upon the floor—"mime atta teppa papa oï," which was equivalent to "Milk fort (auf den) Teppich, Papa (sagte) pfui!" But it is interesting that at this age words were learnt with an erroneous apprehension of their meanings; this was particularly the case with pronouns—"dein Bett," for example, being supposed to mean "das grosse Bett." All words which were spontaneously acquired seemed to be instances of onomatopæia. Adverbs were first used in the 27th month, and now also words which had previously been used to express a variety of associated or generic meanings, were discarded for more specific ones. In the 28th month prepositions were first used, and questions were first asked. In the 29th month the chief advance was in naming self with a pronoun, as in "give me bread"; but the word "I" was not yet spoken. When asked—"Wer ist mir?" the child would say its own name. Although the child had long been able to say its numerals, it was only in this month that it attained to an understanding of their use in counting. In the 32nd month the word "I" was acquired, but still the child seemed to prefer speaking of itself in the third person.

The long disquisition on the acquirement of speech is supplemented by a chapter conveying the observations of other writers upon the same subject. This is followed by an interesting chapter on the development of self-consciousness, and the work concludes with a summary of results. There are also lengthy appendices on the acquirements of correct vision after surgical operations by those who have been born blind, and on the mental condition of uneducated deaf mutes; but we have no space left to go into these subjects. Enough, we trust, has been said to show that Prof. Preyer's laborious undertaking is the most important contribution which has yet appeared to the department of psychology with which it is concerned.

GEORGE J. ROMANES

SCLATER'S "JACAMARS AND PUFF-BIRDS"

A Monograph of the Jacamars and Puff-birds, or Families Galbulidæ and Buccconidæ. By P. L. Sclater, F.R.S., &c. 1 vol. roy. 4to, half-bound Morocco. (London: Dulau and Co., 1882.)

THE completion of another illustrated Ornithological Monograph is an event worthy of record in the columns of NATURE, although the subjects of it are, perhaps, of somewhat limited interest to the scientific world in general. "Jacamars" and "Puff-birds" are, no doubt, well-known groups to the ornithologist, but confined as they are in life to the dense forests of South and Central America, and invisible to most persons even as inhabitants of our Zoological Gardens, their names

certainly do not convey any very definite ideas to the uninitiated. We will, therefore, endeavour to explain in a few words what "Jacamars" and "Puff-birds" are.

The Jacamars or family "Galbulidæ" of naturalists form a small group of birds somewhat resembling the kingfishers in general external structure, but with zygodactyle feet, *i.e.* the toes placed two before and two behind, and with brilliant metallic plumage. They inhabit the forests of America from Guatemala to Southern Brazil, and are generally met with perched upon the outer branches of the trees, and capturing their insect-prey by short flights, after which they return to their former station—like our common flycatcher. The known Jacamars are nineteen in number, referable to six genera. Of all of these species and, in most cases, of both sexes of them, full life-sized figures are given in the present work, from the artistic pencil of M. Keulemans. Of the accompanying letterpress it need only be said that it embraces an account of all the particulars yet known respecting these birds, which at the present time in several cases amounts to very little, and in nearly every instance leaves much to be done before we can be said to have anything like a perfect knowledge of them.

Of the closely allied family of the Bucconidæ or Puff-birds nearly the same may be alleged as regards our knowledge of their life-history. The dense wilds of South America need many further years of constant exploration and minute investigation before such particulars can be duly recorded. The Puff-birds are a more numerous group than the Jacamars. Mr. Sclater recognises forty-four species of the family Bucconidæ, divisible into seven genera. These are treated in exactly the same way as the Jacamars, and illustrated in a similarly artistic manner. No one we think will be likely to find fault with the life-like way in which the artist has represented the various species. Even as a picture-book the Jacamars and Puff-birds form a most attractive volume.

The work now completed is uniform in size and style with Mr. Sharpe's "Kingfishers," Messrs. Marshalls' "Barbets," and Capt. Shelley's "Sun-birds," and forms one of the same series of illustrated Ornithological Monographs prepared by different Members of the British Ornithologists' Union. Nor is the series likely to end here, for we are informed that Mr. Dresser has a companion volume on the "Bee-eaters" in a very forward state, and that other similar works are already projected.

OUR BOOK SHELF

An Illustrated Essay on the Noctuidæ of North America, with "a Colony of Butterflies." By Augustus Radcliffe Grote, A.M., &c. 8vo. (London: Van Voorst, 1882.)

THE main feature in this beautifully-got-up little book consists in the four coloured plates, which depict forty-five of some of the most charming insects of the family of moths, to which the author has devoted his special attention. The species have all been previously described, but all those who have studied *Lepidoptera* know that it is often practically impossible to identify these insects from descriptions only, and will feel grateful to Mr. Grote for the help afforded by these plates, which are very beautiful. They will likewise thank him for identifying many of the North American species "described" by Walker, according to the types in the British Museum. This process of identifying Walker's types appears likely to occupy the attention of entomologists at least to the

end of the present century. The long introductory "Preface" (which forms more than a third of the entire text, and is paged continuously with it) is open to the suggestion of being too rambling in character, and of containing general matter, and polemics, foreign to the title of the book. The chapter on structure and literature will prove very useful. Here, as in the "Preface," a want of concentration in the remarks is observable. The supplementary "Colony of Butterflies" is the most successful part of the work from a literary (and perhaps also from a scientific) point of view. A curious butterfly of a genus of boreal proclivities (*Eneis semidea*) inhabits the summit of Mount Washington (in the White Mountains), above an elevation of 5600 feet to the summit (6293 feet), and is there isolated. Naturally this is associated with the glacial theory (and it might find many parallels in the Alps of Europe, &c.), and the author has contrived to give us a very instructive chapter on this subject, but we do not gather how he came to know that the "colony" first settled "about one hundred thousand years ago."

Six Months in Persia. By Edward Stack. 2 vols. (London: Sampson Low and Co., 1882.)

NOTWITHSTANDING some serious drawbacks, this work will be accepted as a useful contribution to our knowledge of a country about which much ignorance still prevails. It embodies the results of a journey made through the central provinces of Persia last year by a promising member of the Bengal Civil Service *en route* for England. By departing, wherever possible, from the beaten tracks along the main highways between the Persian Gulf and the Caspian, the traveller has succeeded in collecting much useful information regarding many districts about which very little was hitherto known. But the journey having been specially undertaken at some personal inconvenience in the interests of geographical research, it seems all the more surprising that more forethought was not shown by the explorer in qualifying himself for the task. A little time devoted to a study of the broad principles of geology and botany, as well as to the simple methods of taking altitudes, would have enabled him to turn his opportunities to far better account. As it is, these branches of science are almost entirely neglected, and the space which might have been usefully occupied, with such subjects, is too often sacrificed to trivial details irritating to the reader, and swelling the work to undue proportions. As Damāvand was ascended, it would have been more satisfactory, for instance, to have checked the altitude of that famous cone (18,600 feet), taken some years ago by the Russian Caspian Survey, than to be told that at one place there were two little shrines "with small blue domes, date groves and water," at another a ruined mud fort, further on many other ruined mud forts, that one man asked him "endless questions about England which I answered to the best of my ability for the space of two hours," that another "gave me a good dinner," and so on for page after page. Nevertheless some important work, chiefly of a topographical character, was carried out and carefully recorded in the region between Shiraz and Lar, in the Saidābād and Karmān districts, in the neighbourhood of Yazd, and especially in the Bakhtari highlands west of Isfahān. Here the orography and hydrography of the Chahar Mahal and Zarda-kuh uplands were carefully surveyed, and a fresh route explored thence northwards to Gilpaigan. As, according to the latest accounts, the Bakhtari hillmen are again threatening to give trouble to the Prince-Governor of Isfahān, this information may soon prove valuable. These fierce nomads are of the same race and speech as the Kurds, who committed such havoc in the Urmia district last year, and who seem to be again preparing for fresh raids on the Turco-Persian frontier between Azerbaijan and Armenia.